A NEW AUSTRALIAN LICHEN: CLADONIA SULCATA

by

A. W. Archer*

Psoromic acid is a relatively uncommon β-depsidone in the lichen genus *Cladonia*. About 5% (14 out of 276) of the species and varieties of *Cladonia* of which the chemistry is known (Culberson 1969, 1970; Culberson, Culberson and Johnson, 1977) contain psoromic acid and of these 14 only three contain psoromic acid and atranorin. These are *C. norrlinii* Vain. (Vainio, 1922) from north America (Thomson, 1967) and Europe (Ahti, 1977), *C. subconistea* Asah. from Japan (Asahina, 1941) and Taiwan (Ahti and Lai, 1979) and *C. dahliana* Kristinsson reported to occur in Iceland, Greenland and Baffin Island (Kristinsson, 1974). A recent chemical examination of material from Victoria and Tasmania, tentatively identified as *C. diffissa* (F. Wils.) F. Wils. (Wilson, 1889, 1889a), showed some specimens to contain atranorin and psoromic acid, in contrast to the atranorin and norstictic acid found in *C. diffissa*. The specimens containing atranorin and psoromic acid were not referable to *C. norrlinii, C. subconistea* or *C. dahliana* and are here differentiated as a separate species.

DESCRIPTION

Cladonia sulcata A. W. Archer, sp. nov.

Thallus primarius squamulis, 1-3 mm longis, 0.3-1.5 mm latis, supra cinero-glaucescentibus, infra albis, nullis sorediis. Podetia ascendentia squamulis, 10-20 mm altum, nullis scyphis, parte supra ramosa, superficebus sulcatis et subfindescentia, cortice continuo subgranularescenti. Apotheciis ad apices podetiorum, fuscis, convexis, 0.3-0.6 mm diam. Ascosporae non videt. Thallus K+ flavescens, C−, Pd+ flavus. Atranorinum et acidum psoromicum continens.

Primary thallus with squamules, 1-3 mm long, 0.3-1.5 mm wide, upper side pale green, below white, esorediate. *podetia* arising from the squamules, 10-20 mm tall, lacking scyphi, grooved and becoming somewhat split; *cortex* continuous, becoming somewhat granular; *apothecia* on the tips of the podetia, dark brown, convex, 0.3-0.6 mm diam.; *ascospores* not seen. Thallus K+ weak yellow, C−, Pd+ yellow; containing atranorin and psoromic acid.

The presence of atranorin and psoromic acid was demonstrated by thin-layer chromatography and the identity of the compounds confirmed by co-chromatography with authentic samples of the two compounds.

Type Collection: Australia, Victoria, 8 km east of Tawonga, on soil by side of Trapper's Creek Road, approximately 147°15′E, 36°41′S, altitude ca 700 m, 22.xi.1979, *Archer 803* (Holotype: MEL 1031486; Isotype: H, COLO).

Also Examined:

Victoria—ca 2 km north of holotype collection site, 22.xi.1979, *Archer 860A* (MEL 1031487).

Tasmania—7 km north-east of Derwent Bridge, on soil by side of track near Cynthia Bay, Lake St. Clair, approximately 146°10′E, 42°7′S, altitude ca 700 m, 2.iii.1980, *Archer 889* (MEL 1031488).

DISCUSSION

The specific epithet *sulcata* refers to the grooved appearance of the podetia. Typical specimens are illustrated in figure 1.

* Division of Analytical Laboratories, P.O. Box 162, Lidcombe, NSW 2141.

Muelleria 5(1): 115-117 (1982).

Fig. 1. *Cladonia sulcata*. Typical specimens showing podetia with apothecia. Scale in millimetres.

Cladonia sulcata is a member of the *C. cariosa* group and thus differs from the two Australian *Cladonia* species reported as containing psoromic acid. These are *C. staufferi* des Abb. (des Abbayes, 1966), a scyphose species first reported from Mt. Baw Baw, Victoria and an undescribed scyphose sub-alpine species (*Cladonia* sp. B, Dahl, 1970).

The new species differs from the superficially similar *C. diffissa* by the presence of psoromic acid and also in possessing less fissured podetia which, by exposing less of the white internal medullary hyphae, give C. sulcata a greenish appearance compared to the greyish-white appearance of *C. diffissa*. This latter feature is particularly noticeable when the two species are seen growing side by side as at the type location.

Psoromic acid also distinguishes *C. sulcata* from *C. corymbescens* Nyl. ex Leighton, which may occur in south-east Australia with *C. diffissa* but which contains atronorin and fumarprotocetraric acid.

The smaller squamules of *C. sulcata* distinguish this species from *C. dahliana* of the northern hemisphere and also from a chemical variety of *C. symphycarpa* (Ach.) Fr., containing atranorin and psoromic acid, reported from the Great Lakes region of North America (Harris, 1975). The esorediate fissured podetia of *C. sulcata* provide a morphological distinction from the chemically similar but sorediate *C. norlinii* and from *C. subconistea*, an esorediate scyphose species.

ACKNOWLEDGEMENTS

The author is grateful to Dr J. A. Elix of the Australian National University for a gift of psoromic acid and to the Director, Division of Analytical Laboratories, Health Commission of New South Wales, for permission to publish this paper.

REFERENCES

Ahti, T. (1977). *Cladonia*, sub. gen. Cladonia in 'Bestimmungsschlussel Europaischer Flechten', J. Poelt and A. Vezda, eds., p. 66. (J. Cramer: Vaduz).

Ahti, T. and Lai, M.-J. (1979). The lichen genera *Cladonia, Cladina* and *Cladia* in Taiwan. *Ann. Bot. Fennici* 16: 228-236.

Asahina, Y. (1941). Chemismus der Cladonien unter besonder Berücksichtigung der japanischen Arten. *J. Jap. Bot.* 17: 1-7.

Culberson, C. F. (1969). 'Chemical and Botanical Guide to Lichen Products' (University of North Carolina: Chapel Hill, N.C.)
Culberson, C. F. (1970). Supplement to 'Chemical and Botanical Guide to Lichen Products', *Bryologist* 73: 177-377.
Culberson, C. F., Culberson, W. L. and Johnson, A. (1977). Second Supplement to 'Chemical and Botanical Guide to Lichen Products' (Missouri Botanical Garden: St. Louis).
Dahl, E. (1970). 'Keys to Australian Lichens', mimeographed; *Cladonia*, p. 1.
Des Abbayes, H. (1966). Sur quelques *Cladonia* (Lichens) exotiques, nouveaux ou peu connus. *Rev. Bryol. et Lichenol.* 34: 821-828.
Harris, R. C. (1975). Lichens of the Mackinac Straits region. 1. The *Cladonia cariosa* group. *Michigan Botanist* 14: 44-48.
Kristinsson, H. (1974). Two new *Cladonia* and one *Cetraria* species from Iceland. *Lichenologist* 6: 141-145.
Thomson, J. W. (1967). 'The Lichen Genus *Cladonia* in North America', p. 92. (University of Toronto: Toronto).
Vainio, E. (1922). *Cladonia norrlinii. Acta Soc. F. Fl. Fenn.* 53: 86.
Wilson, F. R. M. (1889). A description of forty-one Victorian lichens new to science. *Vict. Nat.* 6: 67.
Wilson, F. R. M. (1889a). Notes on lichens in New South Wales. *Proc. Roy. Soc. Queensl.* 6: 85-93.

Manuscript received 10 August 1981.